CLAIMS:

1. A lifter, comprising:

tongs comprising a set of levers;

an electric motor operatively coupled with the tongs for actuating the tongs; and

a vector drive controller electrically coupled to the electric motor for controlling the operation of the motor.

2. The lifter of claim 1, wherein the electric motor is an alternating current ("AC") induction motor.

3. The lifter of claim 1, wherein the electric motor is a direct current ("DC") motor.

4. The lifter of claim 1, wherein the tongs further comprise:

a jaw-like structure comprising first and second opposing arms having first and second distal ends; and

first and second straight link members pivotally coupled to the first and second opposing arms.

5. The lifter of claim 4, wherein the set of levers comprise:

first and second levers formed integrally with the first and second opposing arms and each lever includes proximate ends; and

pivotally movable junctures located at each proximate end.

6. The lifter of claim 5, further comprising first and second straight link members each including a proximate end and a distal end, wherein the proximate end of the first lever is pivotally attached to the distal end of the second straight link member

and the proximate end of the second lever is pivotally attached to the distal end of the first straight link member by first and second pivot pins located at the respective pivotally movable junctures located at each proximate end of the first and second levers.

7. The lifter of claim 6, wherein the proximate ends of the first and second straight link members are pivotally attached by a third pivot pin.

8. The lifter of claim 4, further comprising a cross bar pivotally attached to the first and second opposing arms.

9. The lifter of claim 4, further comprising first and second jaw elements attached to the first and second distal ends of the first and second opposing arms.

10. The lifter of claim 9, wherein the first and second jaw elements further comprise first and second tong points adapted for contacting and frictionally engaging a load gripped therebetween.

11. The lifter of claim 4, wherein the first and second arms move synchronously in the open position and in the closed position by operation of the electric motor.

12. The lifter of claim 1, further comprising second tongs mechanically coupled to the tongs, wherein the first and second set of tongs are synchronously actuated into the open and the closed positions by the electric motor.

13. The lifter of claim 1, further comprising an encoder coupled to the electric motor for obtaining a measurement of the position of a shaft of the electric motor.

14. The lifter of claim 13, wherein the measurement of the position of the shaft is provided to the vector drive controller as a feedback control signal.

15. The lifter of claim 13, wherein the encoder includes a rotary incremental encoder.

16. The lifter of claim 15, wherein the rotary incremental encoder generates a series of pulses corresponding to the required rotation increment of the shaft.

17. The lifter of claim 1, wherein a shaft of the electric motor is coupled to a gear reducer.

18. The lifter of claim 17, wherein the gear reducer comprises a drive train including a triple reduction gear speed reducer.

19. The lifter of claim 17, wherein the gear reducer includes a helical gear reducer.

20. The lifter of claim 1, wherein a shaft is coupled to a cable drum comprising a drum barrel having first and second ends and flanges located at the first and second ends.

21. The lifter of claim 20, wherein the cable drum may include left-hand and right-hand grooves for accommodating first and second wire ropes extending from the cable drum to a load block assembly that is operatively connected to the tongs.

22. The lifter of claim 21, wherein the tongs and the load block assembly are both rigidly attached to a support beam.

23. The lifter of claim 20, wherein the vector drive controller is coupled to a back-up travel rotary limit switch for coordinating reversing operations with a number of revolutions of the cable drum.

24. The lifter of claim 1, wherein the vector drive controller is coupled to a limit switch for indicating when the first tongs have reached a predetermined position.

25. The lifter of claim 1, further comprising a motor brake coupled to the vector drive controller.

26. The lifter of claim 1, wherein the vector drive controller controls the speed of the electric motor by controlling a voltage applied to one or more windings of the electric motor.

27. The lifter of claim 1, wherein the vector drive controller controls the torque of the electric motor by controlling a phase voltage relative to a current flowing in a stator portion of the electric motor.

28. The lifter of claim 1, further comprising a braking chopper coupled to the vector drive controller for dynamically braking the electric motor.

29. A lifter, comprising:

tongs comprising a set of levers attached to vertically spaced apart top and bottom transverse beams for supporting the tongs; and

a motorized hoist assembly attached to the top beam for synchronously controlling the opening and closing of the tongs;

wherein the motorized hoist further comprises:

an electric motor having a stator, a rotor, and one or more windings and a shaft operatively coupled with the tongs for actuating the tongs to an open position and actuating the tongs to a closed position; and

a vector drive controller electrically coupled to the electric motor for controlling the operation of the electric motor.

30. The lifter of claim 29, wherein the electric motor is an alternating current ("AC") induction motor.

31. The lifter of claim 29, wherein the electric motor is a direct current ("DC") motor.

32. The lifter of claim 29, further comprising second tongs mechanically coupled to the tongs by the bottom beam.

33. The lifter of claim 29, wherein the shaft is coupled to a cable drum comprising a drum barrel having first and second ends and flanges located at the first and second ends.

34. The lifter of claim 33, wherein the cable drum may include left-hand and right-hand grooves for accommodating first and second wire ropes extending from the cable drum to a load block assembly that is operatively connected to the tongs.

35. The lifter of claim 34, wherein the load block assembly is rigidly attached to the bottom beam.

36. The lifter of claim 33, wherein the vector drive controller is coupled to a back-up travel rotary limit for coordinating reversing operations with a number of revolutions of the cable drum.

37. An overhead traveling crane, comprising:

a motorized lifter;

wherein the motorized lifter further comprises:

tongs attached to vertically spaced apart top and bottom transverse beams for supporting the tongs; and

a motorized hoist assembly attached to the top beam for synchronously controlling the opening and closing of the tongs;

wherein the motorized hoist further comprises:

an electric motor having a stator, a rotor, and one or more windings and a shaft operatively coupled with the tongs for actuating the tongs to an open position and actuating the tongs to a closed position; and

a vector drive controller electrically coupled to the electric motor for controlling the operation of the electric motor.

38. The overhead crane of claim 37, wherein the electric motor is an alternating current ("AC") induction motor.

39. The overhead crane of claim 37, wherein the electric motor is a direct current ("DC") motor.

40. The overhead crane of claim 37, further comprising second tongs mechanically coupled to the tongs by the bottom beam.

41. The overhead crane of claim 37, wherein the shaft of the lifter is coupled to a cable drum comprising a drum barrel having first and second ends and flanges located at the first and second ends.

42. The overhead crane of claim 41, wherein the cable drum of the lifter may include left-hand and right-hand grooves for accommodating first and second wire ropes extending from the cable drum to a load block assembly that is operatively connected to the tongs.

43. The overhead crane of claim 42, wherein the load block assembly of the lifter is rigidly attached to the bottom beam.

44. The overhead crane of claim 41, wherein the vector drive controller of the lifter is coupled to a back-up travel rotary limit for coordinating reversing operations with a number of revolutions of the cable drum.

45. A method of handling a load with a motorized lifter including at least one set of tongs and an electric motor coupled to the tongs, the method comprising:

moving the tongs of the motorized lifter to a home position by operation of the electric motor coupled to the tongs, wherein the electric motor is controlled by a vector drive controller;

moving the tongs out of the home position;

placing the tongs over the load; and

positioning the tongs against the load by operation of the vector drive controlled electric motor so as to frictionally engage the load with the tongs.

46. The method of claim 45, wherein the electric motor is an alternating current ("AC") induction motor.

47. The method of claim 45, wherein the electric motor is a direct current ("DC") motor.

48. The method of claim 45, wherein the opening the tongs to a fully open position further comprises:

energizing the electric motor;

providing a control signal to the vector drive controller for actuating the electric motor to place the tongs in an extreme up position;

de-energizing a motor brake; and

de-energizing the electric motor.

49. The method of claim 45, wherein moving the tongs out of the home position further comprises:

placing the vector drive controller in an "on" position;

applying a full voltage signal output to the vector drive controller; and

activating a start pushbutton switch.

50. The method of claim 49, wherein activating the start pushbutton switch further comprises:

electrically energizing the electric motor to a torque level required to maintain the tongs in an open position;

opening the brake motor when sufficient motor torque has developed; and

while the start pushbutton switch is still activated, initiating a close tongs operation and de-activating the start pushbutton switch.

51. The method of claim 45, wherein positioning the tongs on the load further comprises:

applying a control signal until the tongs contact the load; and

when the tongs contact the load, adjusting the control signal to a zero volt output.

52. The method of claim 51, further comprising automatic cable payout without over tensioning for eliminating any slack in a wire rope if a current electric motor torque setting is greater than the wire rope loading.

53. The method of claim 45, further comprising transporting the load.

54. The method of claim 53, further comprising maintaining the control signal output to a zero volt setting throughout all movement of the load.

55. The method of claim 45, further comprising releasing the load.

56. The method of claim 55, wherein releasing the load further comprises adjusting the control signal from a zero voltage output setting to a control voltage output setting until the tongs reach a desired open position to release the load.